

# **A Study of the Whole Atmospheric System Explored by High-Resolution Observations of the Antarctic Atmosphere (AJ0901)**

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Atmospheric circulation is one of the key processes in the climate system. Quantitative understanding of the atmospheric circulation mechanisms based on precise observations is crucial for accurate projection of the global earth climate. In the VIIIth JARE, the PANSY radar, the first mesosphere-stratosphere-troposphere (MST)/incoherent scatter (IS) radar in the Antarctic, was constructed and its continuous operation started. In the IXth JARE, the coupling processes in the earth atmosphere through redistribution of the momentum by atmospheric waves such as gravity waves will be quantified by observations with multi-instruments at Syowa Station and by international collaborations via the MST radar network which was completed by the PANSY radar construction. Numerical simulations using high-resolution general circulation models will take an important role in the interpretation of atmospheric structures captured by the observations and in the quantification of the coupling processes through the atmospheric waves. In addition, the effects of the polar atmosphere on the earth system will be explored by studies of unique phenomena in the polar atmosphere and of an impact on polar atmospheric environment of quite low solar activity which is expected during the IXth JARE period. In this talk, we will present some results of recent studies, which were performed as research activities in this framework.